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Understanding firm dynamics: A progress report on work at the OECD

1. Abstract

Business registers are a rich source of information for economic analysis, providing many insights concealed by more aggregate industry data. In recent years, the OECD has turned to business registers, and to other sources of firm-level data such as longitudinal surveys, in an attempt to better understand the determinants of economic growth and business performance. A first report was published in the June 2001 OECD Economic Outlook (OECD, 2001*a*). It provided international comparisons of turnover rates and survival rates, and detail on the size of exiting firms for 10 OECD countries (Canada, Denmark, Finland, France, Germany, Italy, Netherlands, Portugal, United Kingdom and the United States). The work was based on close co-operation with statistical agencies and researchers in OECD countries, to make the findings from national business registers as comparable as possible.

The work has shown that business registers are indeed promising. It has also shown that there are important statistical problems in making these data comparable across countries, notably as regards the definition of statistical units, differences in size thresholds between countries, as well as problems in distinguishing between real births and deaths of firms and other demographic events in the life of a firm. These statistical issues have not yet been resolved and further progress can potentially be made in improving the comparability of such data, as well as the methods to analyse them, across countries. In addition, a question also arises whether and how such data, or aggregations based on these data, could be integrated in the existing OECD collection of statistics.

To address these issues and explore OECD's future role in the area of firm-level data (including business registers), OECD is organising a workshop in November 2001, in conjunction with the regular meeting of the Statistical Working Party of the Committee on Industry and Business Environment (SWIC). This workshop will bring together officials from statistical agencies, as well as researchers that work with firm-level data. The workshop will seek to achieve the following goals:

- Explore the key statistical issues related to the use of firm-level data. The focus would mainly be on those issues that affect international comparability of these data and the resulting analysis.
- Provide an inventory of the available firm-level statistics in OECD member countries, both business registers and longitudinal surveys.
- Take stock of the existing use of these data, both within OECD member countries and by relevant international organisations.
- Explore the feasibility and nature of OECD's role in this area, e.g. more extensive collection of firm-level statistics; the preparation of a user's guide; or further analytical work based on firm-level statistics to support policy analysis.

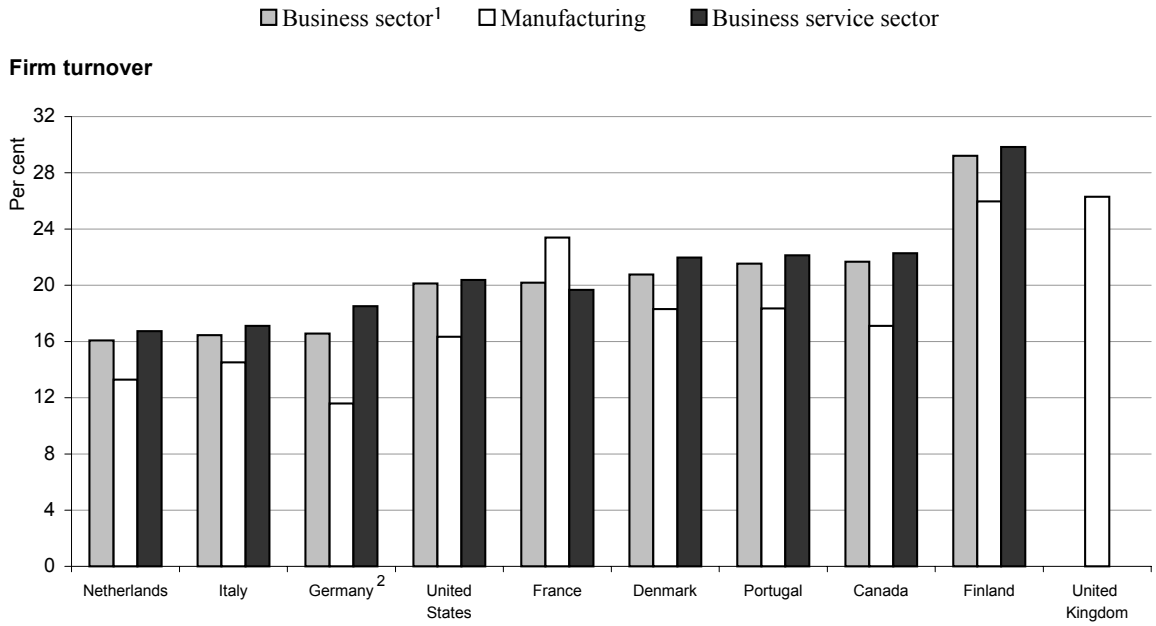
This paper describes the work with business registers (and other firm-level statistics) that has been completed at OECD thus far, the progress that has been made and the difficulties that remain to be resolved. It also discusses the work that is planned in the near future.

2. Recent OECD work on exit, entry and survival

The recent OECD work with firm-level data has been conducted in close co-operation with country experts, who have contributed to the definition of a common analytical framework and the standardisation of key concepts. The work has led to a number of cross-country comparisons, including on entry and exit. This shows that a large number of firms enter and exit most markets every

year (OECD, 2001*a*; Figure 1).

Figure 1. Turnover rates in OECD countries, 1989-94
(entry plus exit rates, annual average)



1. Total economy minus agriculture and community services.
2. Data refer to western Germany.
Source: OECD (2001*a*).

Data covering the first part of the 1990s show that firm turnover rates (entry plus exit rates) are around 20 per cent in the business sector of most countries: *i.e.* a fifth of firms are either recent entrants, or will close down within the year. Turnover rates vary significantly across detailed industries in each OECD country, however, implying that differences in the industry composition influence international comparisons of average turnover. Controlling for the sectoral composition suggests that Germany (western) and Italy have somewhat lower turnover rates than the United States, while turnover is consistently higher in the United Kingdom (manufacturing sector) and especially in Finland.

The firm-level data in the OECD project are based on business registers in Canada, Denmark, France, Finland, Netherlands, United Kingdom and United States, and on social security databases in Germany and Italy. Data for Portugal are drawn from an employment-based register containing information on both establishments and firms. These databases allow firms to be tracked over time because addition or removal of firms from the registers (at least in principle) reflects the actual entry and exit of firms. The entry rate was defined as the number of new firms divided by the total number of incumbent and entrant firms in a given year; the exit rate as the number of firms exiting the market in a given year divided by the population of origin, *i.e.* the incumbents in the previous year. Two aspects of the data have to be borne in mind while comparing the firm-level data across countries:[1]

- *Unit of observation*: The unit of reference in this study is the firm, with the exception of Germany where data are available only with reference to establishments. Firm-based data are likely to more closely represent entities that are responsible for key aspects of decision making compared with plant-level data. However, business registers may define firms at different points in ownership structures; for example some registers consider firms that are effectively controlled by a "parent" firm as separate units, whilst other registers record the parent company only.

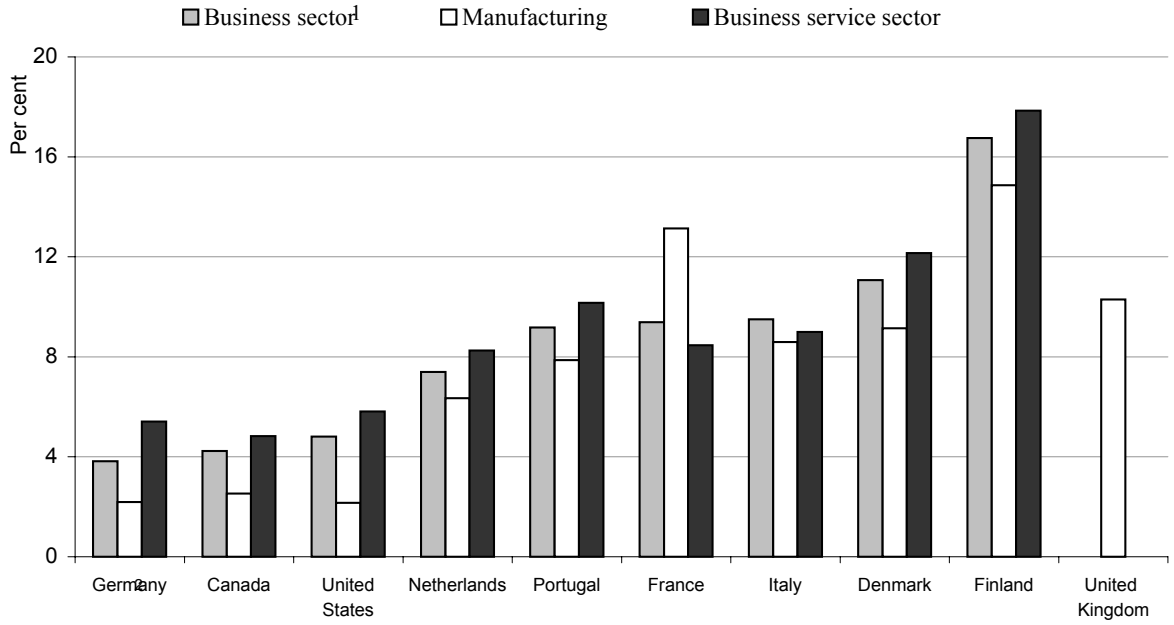
- *Size threshold*: While some registers include even single-person businesses, others omit firms smaller than a certain size, usually in terms of the number of employees but

sometimes in terms of other measures such as sales (as is the case in the data for France and Italy). The data used exclude single-person businesses. However, because smaller firms tend to have more volatile firm dynamics, remaining differences in the threshold across different country datasets should be taken into account in the international comparison.[2]

The industry dimension provides other insights in entry, exit and turnover. If entry was driven by relatively high profits in a given industry and exit occurred primarily in sectors with relatively low profits, there would be a negative cross-sectoral correlation between entry and exit rates. However, confirming previous studies, entry and exit rates are generally highly correlated across industries in OECD countries. This suggests that in every period, a large number of new firms displace a large number of obsolete firms, without affecting significantly the total number of firms or employment in the market at each point in time.

The process of entry and exit of firms involves a proportionally low number of workers: in all but two countries (Finland and Denmark), less than 10 per cent of employment is involved in firm turnover, and in the United States, Germany and Canada, employment-based turnover rates are less than 5 per cent (Figure 2). The difference between firm turnover rates and employment-based turnover rates arises from the fact that entrants (and exiting firms) are generally smaller than incumbents.

Figure 2. Employment turnover due to exit and entry in OECD countries, 1989-94



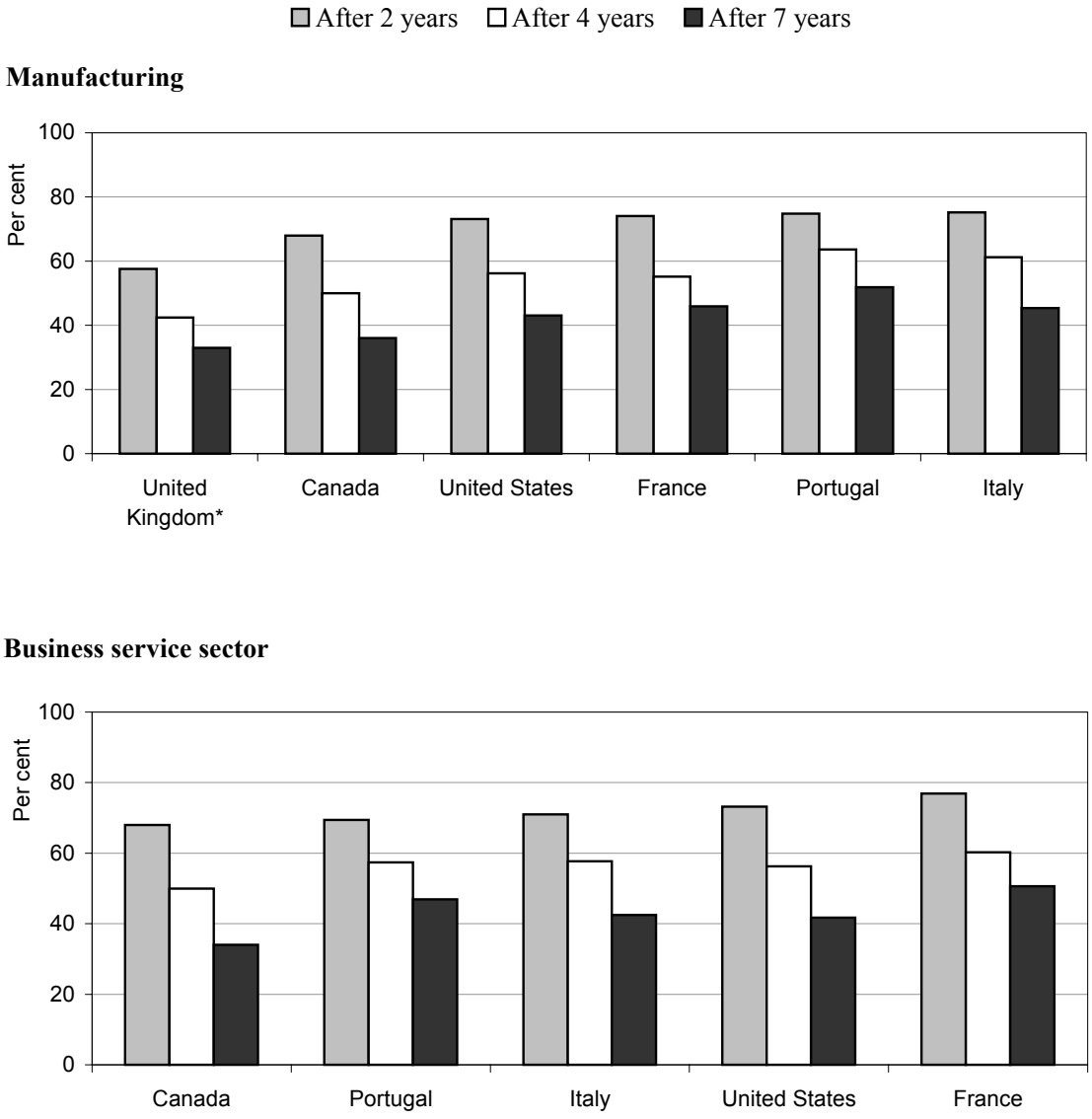
1. Total economy minus agriculture and community services.
2. Data refer to western Germany.

Source: OECD (2001*a*).

The high correlation between entry and exit across industries may be the result of new firms displacing old obsolete units, as well as high failure rates amongst newcomers in the first years of their life. This can be assessed by examining survival rates, *i.e.* the probability that new firms will live beyond a given age (Figure 3). The survival probability for cohorts of firms that entered their respective market in the late 1980s declines steeply in the initial phases of their life: about 20 to 40 per cent of entering firms fail within the first two years. Conditional on overcoming the initial years, the prospect of firms improves in the subsequent period: firms that remain in the business after the first two years have a 60 to 70 per cent chance of surviving for five more years. Nevertheless, only about 30-50 per cent of total entering firms in a given year survive beyond the seventh year. A low survival rate is not necessarily a cause of concern. As argued above, entry by new firms can be seen as a process of experimentation and it is in the nature of this process that the failure rate will be high. This is particularly so if new entry

leads incumbent firms to increase their efficiency and profitability.

Figure 3. Firm survival rates at different lifetimes, 1990s



1. The survival rate at duration (j) is calculated as the probability that a firm from a population of entrants has a lifetime in exess of (j) years. Figures refer to average survival rates estimated for different cohorts of firms that entered the market from the late 1980s to the 1990s.

* Data for the United Kingdom refer to cohorts of firms that entered the market in the 1985-90 period.

Sources: OECD (2001*a*), and Baldwin *et al.* (2000) for Canada.

Must of the interest in exit and entry at the international level is linked to the assumption that countries that are more dynamic (i.e. experience stronger economic performance) should have higher rates of firm turnover. Cross-country studies of firm demographics provide evidence that there are indeed large differences in firm turnover, but do not always demonstrate that countries that perform better have the highest rate of firm turnover.

3. Future OECD work on entry and exit: the issues

The recent OECD work was a first attempt to develop international comparisons of exit, entry and survival on the basis of business registers (and other sources for a few countries) according to a common definition. It involved close co-operation with statistical offices and relevant researchers in member countries. However, it is clear that some comparability problems could not be fully resolved in the project, due to differences in the basic data, concepts and definitions that were used. Four issues seem key (see also Hult, 2001; and Luhtio, 2001):

1. *Coverage: do business registers cover all economic activity?* Business registers record information on firms on the basis of certain criteria, e.g. whether the firm submits tax payments to the government. Many OECD countries have several alternative sources for the register (see Luhtio, 2001). These may be linked to tax declarations (VAT, personal income, corporate, or other), social security records, registrations at chambers of commerce, or other administrative sources. The various sources will not necessarily cover exactly the same firms. The coverage of small and newly created firms, in particular, may differ, as thresholds are not the same across countries. Some OECD countries are currently moving towards a single business register, with the goal to reduce the administrative burden on companies. This has the added advantage that the information from the different sources can be integrated, that the quality and coherence of the information can be improved, and that the coverage of economic activity is likely to be enhanced. In the mean time, however, there are differences in thresholds and the coverage of economic activity across OECD countries, which affects the calculation of indicators related to entrepreneurship. Sensitivity analysis for Canada suggests that the choice of source may have a considerable impact on the entry and exit rates that are calculated (Baldwin, et al, 2001).

2. *What constitutes entry and how can it be measured?* Not all firms that are newly recorded in the business register are new entrants. Firms can also be created through mergers and restructuring, take-overs, spin-offs or out-sourcing of existing companies, changes in legal forms or names, and reactivations of dormant firms. In principle, such demographic events should be considered separately from real births, i.e. the new creation of a combination of production factors without other firms being involved in the creation. The measurement of such real births depends on whether the information available in the business register can distinguish between real births and these other demographic events. Evidence for some OECD countries suggest that false births may be quite important. In Canada, for example, about 6% of births in 1993 were due to ownership changes, 2.6% were due to a reorganisation of the firm in new payroll units, and 0.1% was due to a change in location (Baldwin, et al. 2000). This ratio of real to false births is probably not constant over time, which implies that it is typically not possible to apply a fixed adjustment term to the data for all births (real and false).

3. *What constitutes exit and how can it be measured?* The death of a firm is typically more difficult to measure than its birth. Parallel to the definition of firm births, the death/exit of a firm can be regarded as the dissolution of a combination of production factors, provided that no other firms are involved in the process. Mergers, take-overs, restructuring and break-ups should therefore be considered as separate demographic events. Whether this is possible depends, once more, on whether the business register records these events. Measuring enterprise deaths is confronted with other problems, however. Most business registers do not register deaths in a reliable way and deregistration from the register is not required in many countries. In practice, measuring exit therefore often requires verification of changes in a firm's economic activity from year to year; if it drops to zero or very significantly from one year to the other, the firm is likely to have died.

4. *What is the most appropriate statistical unit to measure exit and entry?* The different business registers in OECD countries cover a variety of statistical units, such as legal units, enterprise units, local units and establishments (Table 1).[1] Exit and entry rates can, in principle, be calculated for these different units. Local units and establishments seems the least appropriate (at least for economy-wide analysis), as these refer to a specific geographical location, not necessarily to an independent combination of production factors. Enterprises (or legal units that provide the legal

1 . ISIC definitions on these different statistical units are contained in United Nations (1990). Eurostat definitions are contained in the Recommendations Manual on the Business Register (Eurostat, 1996).

basis for an enterprise) seem the most relevant, as these refer to independent entities that have some responsibility for decision making. Recent OECD work on entry and exit has typically used the enterprise as the key unit for the analysis of exit and entry (OECD, 2001*a*).

Table 1. Relationship between different statistical units

	One or more locations	**Only one location**
One or more activities	Group of enterprises/Enterprise	Local unit
Only one activity	Kind-of-activity unit	Establishment or homogenous unit of production

Source: United Nations (1990).

If exit and entry can be measured in a reliable way, other indicators of firm demography, such as survival and turnover rates, can be derived fairly easily. But determining exit and entry is not yet straightforward and requires further efforts at the national and international level. Work is currently underway, notably at Eurostat (see Hult, 2001; Luhtio, 2001), but also in statistical offices of other OECD countries, to make progress in measuring exit and entry in a comparable way on the basis of business registers. The Eurostat work uses a common definition of entry and will also calculate exit rates (though only at a later stage; see Hult, 2001). The overview of sources suggests that comparable statistics on exit, entry and survival can not yet easily be derived from the business registers in OECD countries. Further efforts will be required to improve comparability.

4. Workshop on firm-level statistics

The work thus far has shown that there are important statistical problems in working with firm-level data such as business registers, in particular if the findings are to be compared across countries. These statistical issues have not been fully explored and further progress can potentially be made in improving the comparability of such data across countries, as well as the methods to analyse them. In addition, a question arises whether, and if so, how, these data could be integrated in existing international statistical collections, such as those at the OECD. An OECD workshop of the Statistical Working Party of the Committee on Industry and Business Environment, to be held on 26-27 November 2001, will address these issues. It will first address the following questions:

- *Which firm-level data sources are available in OECD member countries?* In response to this question, the OECD is preparing an inventory of the available firm-level statistics in OECD member countries, covering both business registers and other firm-level sources, such as longitudinal surveys. The inventory draws on co-operation with Eurostat, notably a survey by Eurostat on business registers (Luhtio, 2001). The inventory also examines, to the extent possible, whether the different databases are comparable across countries.

- *What are firm-level data used for?* The workshop will take stock of the existing use of these statistics, both within member countries and by relevant international organisations. This will be based on a literature survey prepared by the OECD and on presentations by researchers from OECD member countries during the workshop.

- *What are the main statistical issues in using these data?* An "issues" paper for the workshop will address the main statistical problems in working with firm-level data. The focus is mainly on those issues that affect the international comparability of the data and the resulting analysis, such as differences in definitions, coverage and methods.

If satisfactory responses to these three questions can be derived, it may be possible for the OECD to help move the work in this area forward, e.g. as regards improving the comparability of these data or improving access and use. Several roles are possible:

- *Work to enhance the international comparability of firm-level statistics.* This could involve the preparation of a user's guide, providing metadata and examining methodologies in the

development and use of these data by statistical agencies and academic researchers. Such a guide could also help improve the international comparability of the data, e.g. by proposing shared definitions and classifications for statistical collections. Developing such a guide would require close co-operation with statistical offices in member countries and with relevant international organisations, such as Eurostat.

- *More extensive collection of firm-level statistics*, going beyond the current collection of business statistics by the OECD. While data for individual firms are generally confidential, certain aggregations and findings from firm-level data, such as exit, entry and survival rates by economic activity, could prove a useful addition to existing statistical collections at OECD.[2] In addition, certain countries (e.g Finland and New Zealand) already provide public use files drawn from the firm-level data, which ensure that confidential information is not disclosed.

- *Further analytical work with firm-level data*, to support policy analysis at the OECD and in member countries in specific areas, e.g. entrepreneurship, innovation and technological change, productivity, or the role of SMEs in the economy. This work would require active participation by member countries, due to the confidentiality of the basic data.

An important first step that would need to be taken to make progress in any of these three areas is to agree on a number of key definitions, e.g. on what constitutes entry and exit. If such agreement can be reached, it may prove possible for OECD member countries to collect data or calculate indicators according to agreed definitions. OECD could subsequently gather the data or indicators from member countries and prepare internationally comparable indicators and analysis on aspects of entrepreneurship, such as exit, entry and survival, or the characteristics of new firms.

5. Concluding remarks

There is a growing demand from policy makers and researchers in OECD countries for better statistics on exit and entry, entrepreneurship, and the growth and decline of firms. Eurostat is faced with similar demands as the OECD in this regards, primarily deriving from the 2000 Lisbon Summit. Some important first steps have been taken by statistical offices and international organisations to make indicators of exit and entry more comparable across countries, but further work is needed. OECD can play a useful role in this area, due to its recent work on business demography, its expertise in international comparative statistics and its broad membership. The workshop of November 26-27 2001 is intended as a first step to explore the issues in improving the comparability of firm-level statistics across OECD countries, and may lead to a concrete programme of work on firm-level statistics for the years to come.

Ideally, further OECD work on firm-level statistics should proceed on three tracks, i.e. methodological work, the collection of statistics, and analytical work, as this could provide positive spillovers. However, OECD resources are limited and it will not be possible to proceed in this area without help and guidance from member countries. For example, work to enhance the international comparability of firm-level statistics and the preparation of a user's guide will require close co-operation with member countries and relevant international organisations, such as Eurostat. Moreover, if OECD were to collect certain types of firm-level statistics and indicators, statistical offices should be willing to provide such data to the OECD. Finally, further analytical work will require direct input by researchers in OECD member countries.

2 . Several existing OECD databases rely on aggregations of firm-level statistics, for example, the Structural Statistics for Industry and Services (SSIS), as well as the SME database.

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